

APPENDIX 1

New Survey Benchmark Data Sheets



VICINITY MAP Scale: 1" = 1000'

Reproduced from Google Earth (Imagery Date 11/20/2016)

Station Name: "876 0849 A TIDAL" (HARN)

Location: From the Post Office in Venice, La., proceed southeast on Sate Highway 23 for 0.9 miles to a curve right at the southeast side of town. Continue southeast for 0.35 mile on Highway 23 to a "T" in the road. Turn left and proceed northeast for 0.05 mile on the old highway to a shell road right. Turn and go southeast for 0.15 mile on shell road to the station on the left set between the entrance gates to Freeport Sulphur Company and the Army Corps of Engineers Office. The station is 44 feet east-northeast of a fire hydrant. 31 feet northeast of the center of the shell road, 2.5 feet southwest from a cyclone fence and flush with the ground.

Monument Description: Standard disk attached to a steel rod driven to refusal within a sleeve stamped "0849 A 1985"

Installation Date: August 2002

Date of Survey: December 2017

Monument Established By: Louisiana Department of Transportation

Adjusted NAD83 Geodetic Position

Lat. 29° 16' 00.52816" N

Long. 89° 21' 10.35462" W

Adjusted NAD 83 Datum LSZ (1702) FT

N= 284,325.171

E= 3,912,287.840

Adjusted NAVD88 Elevation (2011)

1.541 FEET (0.470 mtrs.)

Ellipsoid Height = -23.230 mtrs.

Geoid99 Height = -23.700 mtrs.





VICINITY MAP Scale: 1" = 1000'

Reproduced from Google Earth (Imagery Date 11/20/2016)

Station Name: "15-067C-1"

Location: From intersection with Hwy. 23, and Jump Basin Road (which turns into Tide Water Road) travel southwest 2.5 miles on Tide Water Road and turn left on Venice Boat Harbor Road, continue 1.3 miles to station on left, mark is found 58.0 feet northeast of a power pole, 43.0 feet northeast of a stop sign, and 13.5 feet north an asphalt road that runs east and west.

Monument Description: Survey Disk

Installation Date: 2017

Date of Survey: December 2017

Monument Established By: U.S.A.C.E.

Adjusted NAD83 Geodetic Position

Lat. 29° 14' 38.05134" N
Long. 89° 21' 40.71250" W

Adjusted NAD 83 Datum LSZ (1702) FT

N= 275,948.706
E= 3,909,742.757

Adjusted NAVD88 Elevation (2011)

2.377 FEET (0.725 mtrs.)

Ellipsoid Height = -22.929 mtrs.

Geoid99 Height = -23.653mtrs.





VICINITY MAP Scale: 1" = 1000'

Reproduced from Google Earth (Imagery Date 11/20/2016)

Station Name: "CRMSBA SM 14"

Location: By boat from the Joshua's Marina in Buras, LA, go ± 2.7 miles west along the canal to the intersection of another smaller southwest bound canal. Go southwest for approximately 1 mile to Long Bayou. Turn right and go north into Adam's Bay. Motor across Adam's Bay in a northwest direction for ± 4.8 miles to the monument on the North end of the Bay near the mouth of Bayou Maringouin.

Monument Description: Monument is a 9/16 steel rod driven to ?? feet to refusal within a 6" PVC sleeve set in concrete with protective metal access cover stamped "CRMSBA SM 14"

Stamping: CRMSBA SM 14

Installation Date: 2005

Date of Survey: December 2017

Monument Established By: CHUSTZ

Adjusted NAD83 Geodetic Position

Lat. $29^{\circ} 14' 40.68655''$ N

Long. $89^{\circ} 26' 54.29134''$ W

Adjusted NAD83 Datum LSZ (1702) FT

N= 275,747.352

E= 3,881,961.720

Adjusted NAVD88 Height (2011)

Elevation = 1.176 feet (0.358 mtrs.)

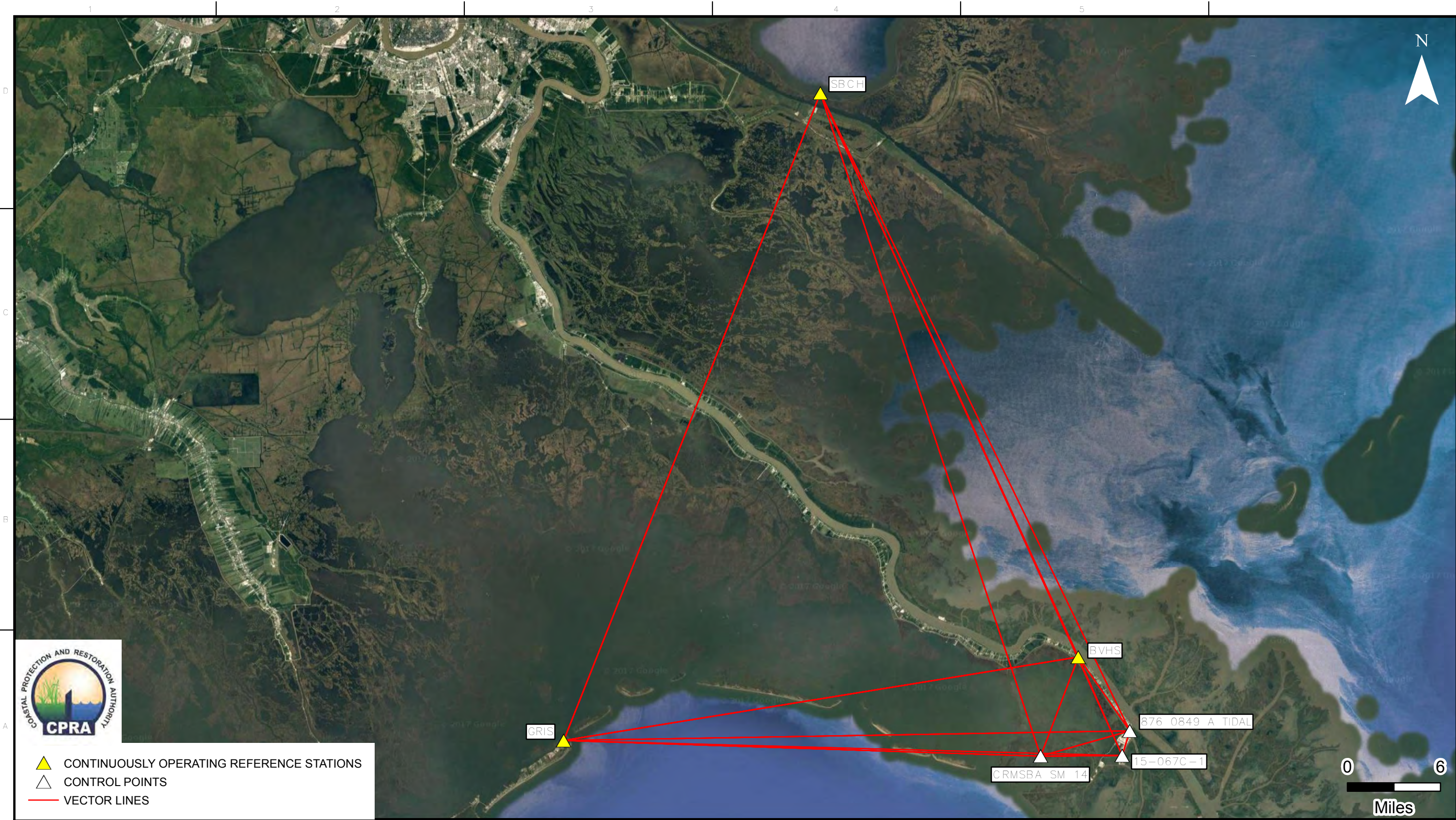
Ellipsoid Height (2011) = -23.306 mtrs.

Geoid 12A Height = -23.664 mtrs.



APPENDIX 2

GPS Network Map





COASTAL PROTECTION AND RESTORATION AUTHORITY
CPRA

 CONTINUOUSLY OPERATING REFERENCE STATIONS

 CONTROL POINTS

 VECTOR LINES



MPH
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TEXAS SURVEY FIRM REGISTRATION NUMBER: 10193786 (HOUMA OFFICE)

OFFICE OF COASTAL PROTECTION & RESTORATION AUTHORITY OF LOUISIANA

GPS NETWORK.
MARSH CREATION FILL AREA SURVEY
DWH BARATARIA BASIN RIDGE AND MARSH CREATION
PROJECT – SPANISH PASS INCREMENT PROJECT BA-203
CAMERON PARISH, LOUISIANA

DRAWN BY: JNIII	SHEET: 1 OF 1
CHECKED BY: JCM	SCALE: 1"=6 MILES
APPROVED BY: JCM	DATE: 1/10/2018
UPDATED:	JOB NO. 1301400
MPH GIS FILE: 1300200GPS001A0.MXD	

APPENDIX 3

GPS Session Schedule

CPRA/Coastal Protection and Restoration Authority
GPS Network Adjustment
“876 0849 A TIDAL”, “CRMSBA-SM-14”, & “15-067C-1”
For
DWH BARATARIA BASIN RIDGE AND MARSH CREATION PROJECT
SPANISH PASS INCREMENT (BA-203)



GPS SESSION SCHEDULE

Date	Monument	Operator/Crew	Session #	Start Time	End Time	Length
12/5/2017	876 0849 A TIDAL	Drake Dupre	1	10:22:42	16:52:42	6:30:00
12/6/2017	CRMSBA SM 14	Drake Dupre	2	8:17:57	10:36:57	2:19:00
12/11/2017	876 0849 A TIDAL	Corey Guidry	3	9:48:12	16:00:57	6:12:45
12/12/2017	15-067C-1	Corey Guidry	4	6:13:42	16:22:27	10:08:45
12/13/2017	CRMSBA SM 14	Corey Guidry	5	8:03:12	14:51:42	6:48:30
12/14/2017	CRMSBA SM 14	Corey Guidry	6	7:53:57	14:35:57	6:42:00

APPENDIX 4

Network Adjustment and OPUS Summary

CPRA/Coastal Protection and Restoration Authority
“876 0849 A TIDAL”, “CRMSBA SM 14”, & “15-067C-1”
 Monument Static Survey For
 DWH Barataria Basin Ridge and Marsh Creation
 Project – Spanish Pass Increment BA-203
 Reconnaissance Survey
 Near Venice, Plaquemines Parish, Louisiana



Minimally Constrained Network Adjustment Summary

TBC Adjusted Values				Published Control Values			Residuals		
Station	Northing (ft)	Easting (ft)	Ht. (ft)	Northing (ft)	Easting (ft)	Ht. (ft)	△Northin g (ft)	△Easting (ft)	△Ht. (ft)
876 0849 A TIDAL	284325.175	3912287.84	1.526	-	-	-	-	-	-
CRMSBA SM 14	275747.355	3881961.726	1.149	-	-	-	-	-	-
15-067C- 1	275948.71	3909742.759	2.355	-	-	-	-	-	-
BVHS	Fixed	Fixed	Fixed	309482.269	3894798.478	31.546	Fixed	Fixed	Fixed
GRIS	281033.463	3719590.215	27.322	281033.474	3719590.183	27.375	0.011	-0.032	0.053
SBCH	501341.848	3806984.532	35.985	501341.887	3806984.526	35.859	0.039	-0.006	-0.126

Fully Constrained Network Adjustment Summary

TBC Adjusted Values				Published Control Values			Precision (95% Confidence Level)		
Station	Northing (ft)	Easting (ft)	El. (ft)	Northing (ft)	Easting (ft)	Ht. (ft)	△Northin g (ft)	△Easting (ft)	△El. (ft)
876 0849 A TIDAL	284325.171	3912287.84	1.541	-	-	-	0.01	0.01	0.025
CRMSBA SM 14	275747.352	3881961.72	1.176	-	-	-	0.009	0.009	0.023
15-067C- 1	275948.706	3909742.757	2.377	-	-	-	0.013	0.013	0.03
BVHS	Fixed	Fixed	Fixed	309482.269	3894798.478	31.546	Fixed	Fixed	Fixed
GRIS	Fixed	Fixed	Fixed	281033.474	3719590.183	27.375	Fixed	Fixed	Fixed
SBCH	Fixed	Fixed	Fixed	501341.887	3806984.526	35.859	Fixed	Fixed	Fixed

OPUS Elevation Survey

Final OPUS Values						
Station	Elevation (m)	Elevation (ft)	RMS	Notes	TBC Adjusted Elevation (ft)	△Elev. (ft)*
876 0849 A TIDAL	0.436	1.43	0.017		1.541	-0.111
	0.444	1.457	0.017		1.541	-0.084
Average	0.44	1.444				-0.098

Final OPUS Values						
Station	Elevation (m)	Elevation (ft)	RMS	Notes	TBC Adjusted Elevation (ft)	△Elev. (ft)*
CRMSBA SM 14	0.341	1.119	0.014		1.176	-0.057
	0.33	1.083	0.014		1.176	-0.093
	0.332	1.089	0.015		1.176	-0.087
Average	0.334	1.097				-0.079

Final OPUS Values						
Station	Elevation (m)	Elevation (ft)	RMS	Notes	TBC Adjusted Elevation (ft)	△Elev. (ft)*
15-067C- 1	0.686	2.251	0.016		2.377	-0.126

*- Elevations expressed in NAVD88 computed using GEOID 12B

APPENDIX 5

Initial and Weighted Free Network Adjustment Report

Project File Data		Coordinate System	
Name:	C:\Users\ldrennan\Documents\Trimble Business Center\13002 Static.vce	Name:	US State Plane 1983
Size:	452 KB	Datum:	NAD 1983 (Conus)
Modified:	1/23/2018 7:49:08 AM (UTC:-6)	Zone:	Louisiana South 1702
Time zone:	Central Standard Time	Geoid:	GEOID12B (Conus)
Reference number:		Vertical datum:	
Description:		Calibrated site:	
Comment 1:			
Comment 2:			
Comment 3:			

Additional Coordinate System Details

Local Site Settings			
Project latitude:	?	Ground scale factor:	1
Project longitude:	?	False northing offset:	0.000 ft
Project height:	0.000 ft	False easting offset:	0.000 ft

Network Adjustment Report

Adjustment Settings

Set-Up Errors

GNSS

Error in Height of Antenna: 0.006 ft

Centering Error: 0.010 ft

Covariance Display

Horizontal:

Propagated Linear Error [E]: U.S.

Constant Term [C]: 0.000 ft

Scale on Linear Error [S]: 1.960

Three-Dimensional

Propagated Linear Error [E]: U.S.

Constant Term [C]: 0.000 ft

Scale on Linear Error [S]: 1.960

Adjustment Statistics

Number of Iterations for Successful Adjustment:	2
Network Reference Factor:	0.96
Chi Square Test (95%):	Passed
Precision Confidence Level:	95%
Degrees of Freedom:	165

Post Processed Vector Statistics

Reference Factor:	0.85
Redundancy Number:	96.06
A Priori Scalar:	0.85

RTK Vector Statistics

Reference Factor:	1.09
Redundancy Number:	68.94
A Priori Scalar:	1.69

Control Coordinate Comparisons

Values shown are control coordinates minus adjusted coordinates.

Point ID	Δ Northing (US survey foot)	Δ Easting (US survey foot)	Δ Elevation (US survey foot)	Δ Height (US survey foot)
GRIS	0.011	-0.032	?	0.053
SBCH	0.039	-0.005	?	-0.127

Control Point Constraints

Point ID	Type	North σ (US survey foot)	East σ (US survey foot)	Height σ (US survey foot)	Elevation σ (US survey foot)
BVHS	Local	Fixed	Fixed	Fixed	
Fixed = 0.000003(US survey foot)					

Adjusted Grid Coordinates

Point ID							Constr:
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	Northing (US survey foot)	Northing Error (US survey foot)	Easting (US survey foot)	Easting Error (US survey foot)	Elevation (US survey foot)	Elevation Error (US survey foot)	
15-067C-1	275948.710	0.013	3909742.759	0.013	2.355	0.029	
876 0849 A TIDAL	284325.175	0.011	3912287.840	0.010	1.526	0.024	
BVHS	309482.269	?	3894798.478	?	31.546	?	LLh
CRMSBA SM 14	275747.355	0.010	3881961.726	0.009	1.149	0.023	
GRIS	281033.463	0.008	3719590.215	0.008	27.322	0.024	
SBCH	501341.848	0.009	3806984.532	0.008	35.985	0.025	

Adjusted Geodetic Coordinates

Point ID	Latitude	Longitude	Height (US survey foot)	Height Error (US survey foot)	Constraint
15-067C-1	N29°14'38.05139"	W89°21'40.71248"	-75.248	0.029	
876 0849 A TIDAL	N29°16'00.52820"	W89°21'10.35462"	-76.230	0.024	
BVHS	N29°20'12.48974"	W89°24'23.01021"	-46.745	?	LLh
CRMSBA SM 14	N29°14'40.68658"	W89°26'54.29127"	-76.489	0.023	
GRIS	N29°15'55.88289"	W89°57'26.26190"	-51.339	0.024	
SBCH	N29°52'05.20544"	W89°40'23.63827"	-48.603	0.025	

Adjusted ECEF Coordinates

Point ID	X (US survey foot)	X Error (US	Y (US survey foot)	Y Error (US	Z (US survey foot)	Z Error (US	3D Error (US	Constraint
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		survey foot)		survey foot)		survey foot)	survey foot)	
15-067C-1	203691.141	0.013	-18271996.489	0.026	10162401.664	0.018	0.034	
876 0849 A TIDAL	206334.401	0.010	-18267894.226	0.022	10169669.756	0.015	0.028	
BVHS	189142.939	?	-18255649.118	?	10191879.302	?	?	LLh
CRMSBA SM 14	175911.234	0.009	-18272153.921	0.021	10162633.319	0.014	0.027	
GRIS	13616.907	0.008	-18269305.488	0.022	10169272.582	0.014	0.027	
SBCH	103575.609	0.008	-18160886.039	0.022	10359876.780	0.014	0.028	

Error Ellipse Components

Point ID	Semi-major axis (US survey foot)	Semi-minor axis (US survey foot)	Azimuth
15-067C-1	0.016	0.016	168°
876 0849 A TIDAL	0.013	0.013	167°
CRMSBA SM 14	0.012	0.011	173°
GRIS	0.010	0.010	64°
SBCH	0.011	0.010	166°

Adjusted GNSS Observations

Observation ID		Observation	A-posteriori Error	Residual	Standardized Residual
BVHS-876 0849 A TIDAL (V85)	Az.	146°09'23"	0.070 sec	0.386 sec	2.191
	ΔHt.	-29.485 ft	0.024 ft	-0.126 ft	-3.526
	Ellip Dist.	30639.154 ft	0.011 ft	-0.003 ft	-0.122
BVHS --> 876 0849 A TIDAL (PV33)	Az.	146°09'23"	0.070 sec	-0.097 sec	-1.280
	ΔHt.	-29.485 ft	0.024 ft	0.021 ft	0.968
	Ellip Dist.	30639.154 ft	0.011 ft	0.037 ft	3.328

BVHS --> 876 0849 A TIDAL (PV1)	Az.	146°09'23"	0.070 sec	0.021 sec	0.265
	ΔHt.	-29.485 ft	0.024 ft	0.031 ft	1.135
	Ellip Dist.	30639.154 ft	0.011 ft	-0.033 ft	-2.874
SBCH --> 876 0849 A TIDAL (PV9)	Az.	154°56'48"	0.009 sec	0.014 sec	1.234
	ΔHt.	-27.627 ft	0.030 ft	0.006 ft	0.135
	Ellip Dist.	241225.682 ft	0.012 ft	-0.045 ft	-2.836
876 0849 A TIDAL-15-067C-1 (V86)	Az.	197°53'27"	0.325 sec	1.995 sec	2.791
	ΔHt.	0.982 ft	0.028 ft	-0.024 ft	-0.439
	Ellip Dist.	8754.491 ft	0.014 ft	-0.026 ft	-0.868
BVHS --> 15-067C-1 (PV36)	Az.	156°56'37"	0.072 sec	-0.048 sec	-0.777
	ΔHt.	-28.502 ft	0.029 ft	0.021 ft	0.813
	Ellip Dist.	36712.740 ft	0.013 ft	0.029 ft	2.610
CRMSBA SM 14-15-067C-1 (V629)	Az.	90°31'40"	0.102 sec	0.096 sec	0.307
	ΔHt.	1.241 ft	0.029 ft	-0.090 ft	-1.393
	Ellip Dist.	27781.422 ft	0.013 ft	-0.087 ft	-2.551
15-067C-1-CRMSBA SM 14 (V711)	Az.	270°34'13"	0.102 sec	-0.751 sec	-2.456
	ΔHt.	-1.241 ft	0.029 ft	0.027 ft	0.389
	Ellip Dist.	27781.422 ft	0.013 ft	-0.076 ft	-1.974
876 0849 A TIDAL-CRMSBA SM 14 (V49)	Az.	255°11'46"	0.079 sec	-0.530 sec	-2.328
	ΔHt.	-0.259 ft	0.027 ft	0.004 ft	0.073
	Ellip Dist.	31515.599 ft	0.012 ft	-0.061 ft	-1.638
BVHS --> CRMSBA SM 14 (PV14)	Az.	201°47'46"	0.053 sec	0.140 sec	2.098
	ΔHt.	-29.743 ft	0.023 ft	0.012 ft	0.467
	Ellip Dist.	36094.615 ft	0.009 ft	-0.002 ft	-0.209
	Az.	201°47'46"	0.053 sec		-1.870

BVHS --> CRMSBA SM 14 (PV2)				-0.129 sec	
	ΔHt.	-29.743 ft	0.023 ft	-0.011 ft	-0.338
	Ellip Dist.	36094.615 ft	0.009 ft	0.010 ft	0.855
15-067C-1-876 0849 A TIDAL (V166)	Az.	17°53'13"	0.325 sec	-1.374 sec	-1.809
	ΔHt.	-0.982 ft	0.028 ft	-0.012 ft	-0.254
	Ellip Dist.	8754.491 ft	0.014 ft	0.044 ft	1.363
GRIS --> 876 0849 A TIDAL (PV25)	Az.	89°42'46"	0.012 sec	0.015 sec	1.069
	ΔHt.	-24.891 ft	0.029 ft	0.004 ft	0.092
	Ellip Dist.	192724.335 ft	0.011 ft	0.026 ft	1.740
GRIS --> 876 0849 A TIDAL (PV4)	Az.	89°42'46"	0.012 sec	-0.012 sec	-0.838
	ΔHt.	-24.891 ft	0.029 ft	0.032 ft	0.705
	Ellip Dist.	192724.335 ft	0.011 ft	-0.026 ft	-1.732
876 0849 A TIDAL-15-067C-1 (V165)	Az.	197°53'27"	0.325 sec	1.310 sec	1.635
	ΔHt.	0.982 ft	0.028 ft	-0.022 ft	-0.370
	Ellip Dist.	8754.491 ft	0.014 ft	-0.032 ft	-0.940
15-067C-1-CRMSBA SM 14 (V784)	Az.	270°34'13"	0.102 sec	-0.307 sec	-1.168
	ΔHt.	-1.241 ft	0.029 ft	0.104 ft	1.616
	Ellip Dist.	27781.422 ft	0.013 ft	-0.065 ft	-1.617
CRMSBA SM 14-876 0849 A TIDAL (V627)	Az.	75°08'58"	0.079 sec	-0.035 sec	-0.155
	ΔHt.	0.259 ft	0.027 ft	0.008 ft	0.111
	Ellip Dist.	31515.599 ft	0.012 ft	0.061 ft	1.580
SBCH --> CRMSBA SM 14 (PV18)	Az.	162°26'46"	0.008 sec	0.015 sec	1.316
	ΔHt.	-27.885 ft	0.029 ft	0.019 ft	0.446
	Ellip Dist.	237737.078 ft	0.010 ft	-0.024 ft	-1.539
876 0849 A TIDAL-CRMSBA SM 14 (V14)	Az.	255°11'46"	0.079 sec	-0.336 sec	-1.535

	ΔHt.	-0.259 ft	0.027 ft	0.010 ft	0.170
	Ellip Dist.	31515.599 ft	0.012 ft	-0.043 ft	-1.429
BVHS --> CRMSBA SM 14 (PV16)	Az.	201°47'46"	0.053 sec	0.040 sec	0.603
	ΔHt.	-29.743 ft	0.023 ft	-0.037 ft	-1.531
	Ellip Dist.	36094.615 ft	0.009 ft	-0.013 ft	-1.127
15-067C-1-876 0849 A TIDAL (V710)	Az.	17°53'13"	0.325 sec	-1.129 sec	-1.495
	ΔHt.	-0.982 ft	0.028 ft	0.014 ft	0.243
	Ellip Dist.	8754.491 ft	0.014 ft	-0.046 ft	-1.119
876 0849 A TIDAL-CRMSBA SM 14 (V87)	Az.	255°11'46"	0.079 sec	0.420 sec	1.479
	ΔHt.	-0.259 ft	0.027 ft	-0.009 ft	-0.120
	Ellip Dist.	31515.599 ft	0.012 ft	0.025 ft	0.650
CRMSBA SM 14-15-067C-1 (V626)	Az.	90°31'40"	0.102 sec	-0.231 sec	-0.868
	ΔHt.	1.241 ft	0.029 ft	-0.045 ft	-0.627
	Ellip Dist.	27781.422 ft	0.013 ft	0.056 ft	1.449
GRIS --> 15-067C-1 (PV26)	Az.	92°13'23"	0.014 sec	0.019 sec	1.387
	ΔHt.	-23.909 ft	0.033 ft	-0.006 ft	-0.130
	Ellip Dist.	190218.643 ft	0.013 ft	0.018 ft	1.212
SBCH --> 876 0849 A TIDAL (PV28)	Az.	154°56'48"	0.009 sec	-0.016 sec	-1.363
	ΔHt.	-27.627 ft	0.030 ft	0.039 ft	0.775
	Ellip Dist.	241225.682 ft	0.012 ft	0.022 ft	1.346
SBCH --> 15-067C-1 (PV30)	Az.	156°19'20"	0.011 sec	-0.003 sec	-0.296
	ΔHt.	-26.644 ft	0.033 ft	0.029 ft	0.579
	Ellip Dist.	247721.938 ft	0.014 ft	0.021 ft	1.295
CRMSBA SM 14-15-067C-1 (V505)	Az.	90°31'40"	0.102 sec	-0.305 sec	-1.261
	ΔHt.	1.241 ft	0.029 ft	-0.007 ft	-0.158
		27781.422 ft	0.013 ft	0.000 ft	0.004

	Ellip Dist.				
BVHS --> SBCH (PV11)	Az.	336°22'08"	0.008 sec	0.003 sec	0.272
	ΔHt.	-1.858 ft	0.025 ft	0.019 ft	0.432
	Ellip Dist.	211010.771 ft	0.009 ft	0.018 ft	1.185
15-067C-1-CRMSBA SM 14 (V494)	Az.	270°34'13"	0.102 sec	-0.266 sec	-0.992
	ΔHt.	-1.241 ft	0.029 ft	-0.002 ft	-0.026
	Ellip Dist.	27781.422 ft	0.013 ft	-0.014 ft	-0.447
GRIS --> CRMSBA SM 14 (PV24)	Az.	92°33'20"	0.013 sec	-0.016 sec	-0.968
	ΔHt.	-25.150 ft	0.028 ft	0.026 ft	0.645
	Ellip Dist.	162455.946 ft	0.010 ft	-0.011 ft	-0.867
876 0849 A TIDAL-15-067C-1 (V13)	Az.	197°53'27"	0.325 sec	0.544 sec	0.839
	ΔHt.	0.982 ft	0.028 ft	0.012 ft	0.304
	Ellip Dist.	8754.491 ft	0.014 ft	-0.011 ft	-0.364
BVHS --> GRIS (PV3)	Az.	261°44'17"	0.009 sec	0.012 sec	0.766
	ΔHt.	-4.594 ft	0.024 ft	0.011 ft	0.252
	Ellip Dist.	177502.913 ft	0.008 ft	-0.001 ft	-0.034
15-067C-1-CRMSBA SM 14 (V502)	Az.	270°34'13"	0.102 sec	-0.012 sec	-0.043
	ΔHt.	-1.241 ft	0.029 ft	-0.051 ft	-0.751
	Ellip Dist.	27781.422 ft	0.013 ft	-0.014 ft	-0.327
GRIS --> SBCH (PV10)	Az.	22°19'37"	0.007 sec	-0.002 sec	-0.179
	ΔHt.	2.736 ft	0.026 ft	0.020 ft	0.527
	Ellip Dist.	237019.365 ft	0.009 ft	0.011 ft	0.750
BVHS --> SBCH (PV19)	Az.	336°22'08"	0.008 sec	0.004 sec	0.273
	ΔHt.	-1.858 ft	0.025 ft	0.011 ft	0.202
	Ellip Dist.	211010.771 ft	0.009 ft	0.011 ft	0.688
CRMSBA SM 14-876 0849 A TIDAL (V504)	Az.	75°08'58"	0.079 sec	0.010 sec	0.034

	ΔHt.	0.259 ft	0.027 ft	-0.005 ft	-0.057
	Ellip Dist.	31515.599 ft	0.012 ft	0.028 ft	0.681
GRIS --> CRMSBA SM 14 (PV13)	Az.	92°33'20"	0.013 sec	-0.010 sec	-0.601
	ΔHt.	-25.150 ft	0.028 ft	-0.032 ft	-0.674
	Ellip Dist.	162455.946 ft	0.010 ft	-0.003 ft	-0.251
GRIS --> SBCH (PV27)	Az.	22°19'37"	0.007 sec	-0.003 sec	-0.215
	ΔHt.	2.736 ft	0.026 ft	-0.032 ft	-0.668
	Ellip Dist.	237019.365 ft	0.009 ft	-0.005 ft	-0.305
SBCH --> CRMSBA SM 14 (PV12)	Az.	162°26'46"	0.008 sec	-0.007 sec	-0.620
	ΔHt.	-27.885 ft	0.029 ft	-0.034 ft	-0.650
	Ellip Dist.	237737.078 ft	0.010 ft	-0.001 ft	-0.061
CRMSBA SM 14-876 0849 A TIDAL (V628)	Az.	75°08'58"	0.079 sec	0.139 sec	0.633
	ΔHt.	0.259 ft	0.027 ft	-0.006 ft	-0.111
	Ellip Dist.	31515.599 ft	0.012 ft	-0.014 ft	-0.461
BVHS --> SBCH (PV8)	Az.	336°22'08"	0.008 sec	-0.001 sec	-0.069
	ΔHt.	-1.858 ft	0.025 ft	0.025 ft	0.584
	Ellip Dist.	211010.771 ft	0.009 ft	0.000 ft	-0.012
GRIS --> SBCH (PV29)	Az.	22°19'37"	0.007 sec	-0.006 sec	-0.559
	ΔHt.	2.736 ft	0.026 ft	-0.009 ft	-0.207
	Ellip Dist.	237019.365 ft	0.009 ft	0.003 ft	0.187
GRIS --> SBCH (PV7)	Az.	22°19'37"	0.007 sec	-0.003 sec	-0.245
	ΔHt.	2.736 ft	0.026 ft	0.023 ft	0.557
	Ellip Dist.	237019.365 ft	0.009 ft	-0.007 ft	-0.467
BVHS --> GRIS (PV5)	Az.	261°44'17"	0.009 sec	0.005 sec	0.337
	ΔHt.	-4.594 ft	0.024 ft	0.024 ft	0.557
			0.008 ft	0.008 ft	0.537

	Ellip Dist.	177502.913 ft			
15-067C-1-876 0849 A TIDAL (V503)	Az.	17°53'13"	0.325 sec	0.134 sec	0.131
	ΔHt.	-0.982 ft	0.028 ft	-0.004 ft	-0.037
	Ellip Dist.	8754.491 ft	0.014 ft	0.023 ft	0.537
876 0849 A TIDAL-15-067C-1 (V50)	Az.	197°53'27"	0.325 sec	0.431 sec	0.533
	ΔHt.	0.982 ft	0.028 ft	-0.017 ft	-0.247
	Ellip Dist.	8754.491 ft	0.014 ft	-0.016 ft	-0.454
SBCH --> CRMSBA SM 14 (PV21)	Az.	162°26'46"	0.008 sec	0.000 sec	0.034
	ΔHt.	-27.885 ft	0.029 ft	-0.010 ft	-0.199
	Ellip Dist.	237737.078 ft	0.010 ft	-0.008 ft	-0.514
GRIS --> BVHS (PV15)	Az.	81°28'06"	0.009 sec	0.002 sec	0.154
	ΔHt.	4.594 ft	0.024 ft	-0.024 ft	-0.506
	Ellip Dist.	177502.913 ft	0.008 ft	0.001 ft	0.034
876 0849 A TIDAL-CRMSBA SM 14 (V164)	Az.	255°11'46"	0.079 sec	0.030 sec	0.099
	ΔHt.	-0.259 ft	0.027 ft	-0.022 ft	-0.229
	Ellip Dist.	31515.599 ft	0.012 ft	0.026 ft	0.488
GRIS --> BVHS (PV32)	Az.	81°28'06"	0.009 sec	-0.004 sec	-0.253
	ΔHt.	4.594 ft	0.024 ft	-0.020 ft	-0.465
	Ellip Dist.	177502.913 ft	0.008 ft	0.001 ft	0.045
SBCH --> GRIS (PV20)	Az.	202°28'02"	0.007 sec	-0.001 sec	-0.095
	ΔHt.	-2.736 ft	0.026 ft	-0.023 ft	-0.461
	Ellip Dist.	237019.365 ft	0.009 ft	0.003 ft	0.174
15-067C-1-CRMSBA SM 14 (V167)	Az.	270°34'13"	0.102 sec	-0.110 sec	-0.439
	ΔHt.	-1.241 ft	0.029 ft	-0.024 ft	-0.324
	Ellip Dist.	27781.422 ft	0.013 ft	-0.013 ft	-0.402

15-067C-1-876 0849 A TIDAL (V493)	Az.	17°53'13"	0.325 sec	-0.189 sec	-0.250
	ΔHt.	-0.982 ft	0.028 ft	-0.026 ft	-0.426
	Ellip Dist.	8754.491 ft	0.014 ft	0.000 ft	-0.003
BVHS --> SBCH (PV17)	Az.	336°22'08"	0.008 sec	0.002 sec	0.118
	ΔHt.	-1.858 ft	0.025 ft	-0.017 ft	-0.403
	Ellip Dist.	211010.771 ft	0.009 ft	-0.004 ft	-0.285
BVHS --> SBCH (PV34)	Az.	336°22'08"	0.008 sec	-0.003 sec	-0.228
	ΔHt.	-1.858 ft	0.025 ft	-0.015 ft	-0.340
	Ellip Dist.	211010.771 ft	0.009 ft	0.000 ft	0.017
SBCH --> GRIS (PV22)	Az.	202°28'02"	0.007 sec	0.003 sec	0.296
	ΔHt.	-2.736 ft	0.026 ft	0.002 ft	0.038
	Ellip Dist.	237019.365 ft	0.009 ft	-0.002 ft	-0.147
GRIS --> CRMSBA SM 14 (PV6)	Az.	92°33'20"	0.013 sec	0.003 sec	0.182
	ΔHt.	-25.150 ft	0.028 ft	0.013 ft	0.291
	Ellip Dist.	162455.946 ft	0.010 ft	0.002 ft	0.122
GRIS --> BVHS (PV23)	Az.	81°28'06"	0.009 sec	-0.003 sec	-0.211
	ΔHt.	4.594 ft	0.024 ft	0.009 ft	0.209
	Ellip Dist.	177502.913 ft	0.008 ft	0.004 ft	0.273
GRIS --> BVHS (PV35)	Az.	81°28'06"	0.009 sec	-0.004 sec	-0.253
	ΔHt.	4.594 ft	0.024 ft	-0.009 ft	-0.204
	Ellip Dist.	177502.913 ft	0.008 ft	0.001 ft	0.087
BVHS --> SBCH (PV31)	Az.	336°22'08"	0.008 sec	0.000 sec	0.009
	ΔHt.	-1.858 ft	0.025 ft	-0.012 ft	-0.243
	Ellip Dist.	211010.771 ft	0.009 ft	-0.003 ft	-0.164

Covariance Terms

From Point	To Point		Components	A-posteriori Error	Horiz. Precision (Ratio)	3D Precision (Ratio)
876 0849 A TIDAL	15-067C-1	Az.	197°53'27"	0.324 sec	1 : 622874	1 : 623039
		ΔHt.	0.982 ft	0.028 ft		
		ΔElev.	0.830 ft	0.028 ft		
		Ellip Dist.	8754.491 ft	0.014 ft		
876 0849 A TIDAL	BVHS	Az.	326°10'58"	0.070 sec	1 : 2888716	1 : 2888312
		ΔHt.	29.485 ft	0.024 ft		
		ΔElev.	30.020 ft	0.024 ft		
		Ellip Dist.	30639.154 ft	0.011 ft		
876 0849 A TIDAL	CRMSBA SM 14	Az.	255°11'46"	0.080 sec	1 : 2682541	1 : 2683170
		ΔHt.	-0.259 ft	0.027 ft		
		ΔElev.	-0.377 ft	0.027 ft		
		Ellip Dist.	31515.599 ft	0.012 ft		
876 0849 A TIDAL	GRIS	Az.	270°00'30"	0.012 sec	1 : 17361798	1 : 17364612
		ΔHt.	24.891 ft	0.029 ft		
		ΔElev.	25.796 ft	0.029 ft		
		Ellip Dist.	192724.335 ft	0.011 ft		
876 0849 A TIDAL	SBCH	Az.	335°06'17"	0.009 sec	1 : 20900542	1 : 20892179
		ΔHt.	27.627 ft	0.030 ft		
		ΔElev.	34.460 ft	0.030 ft		
		Ellip Dist.	241225.682 ft	0.012 ft		
BVHS	15-067C-1	Az.	156°56'37"	0.072 sec	1 : 2809152	1 : 2808929
		ΔHt.	-28.502 ft	0.029 ft		
		ΔElev.	-29.191 ft	0.029 ft		
		Ellip Dist.	36712.740 ft	0.013 ft		
BVHS	GRIS	Az.	261°44'17"	0.009 sec	1 : 21270206	1 : 21277336
		ΔHt.	-4.594 ft	0.024 ft		
		ΔElev.	-4.224 ft	0.024 ft		
				0.008 ft		

		Ellip Dist.	177502.913 ft			
BVHS	SBCH	Az.	336°22'08"	0.008 sec	1 : 24050837	1 : 24038477
		ΔHt.	-1.858 ft	0.025 ft		
		ΔElev.	4.439 ft	0.025 ft		
		Ellip Dist.	211010.771 ft	0.009 ft		
CRMSBA SM 14	15-067C-1	Az.	90°31'40"	0.102 sec	1 : 2078079	1 : 2077923
		ΔHt.	1.241 ft	0.029 ft		
		ΔElev.	1.206 ft	0.029 ft		
		Ellip Dist.	27781.422 ft	0.013 ft		
CRMSBA SM 14	BVHS	Az.	21°46'32"	0.053 sec	1 : 3804975	1 : 3807297
		ΔHt.	29.743 ft	0.023 ft		
		ΔElev.	30.397 ft	0.023 ft		
		Ellip Dist.	36094.615 ft	0.009 ft		
CRMSBA SM 14	GRIS	Az.	272°48'15"	0.013 sec	1 : 17069494	1 : 17070615
		ΔHt.	25.150 ft	0.028 ft		
		ΔElev.	26.173 ft	0.028 ft		
		Ellip Dist.	162455.946 ft	0.010 ft		
CRMSBA SM 14	SBCH	Az.	342°33'26"	0.008 sec	1 : 22689491	1 : 22679180
		ΔHt.	27.885 ft	0.029 ft		
		ΔElev.	34.837 ft	0.029 ft		
		Ellip Dist.	237737.078 ft	0.010 ft		
GRIS	15-067C-1	Az.	92°13'23"	0.014 sec	1 : 14314806	1 : 14315154
		ΔHt.	-23.909 ft	0.033 ft		
		ΔElev.	-24.967 ft	0.033 ft		
		Ellip Dist.	190218.643 ft	0.013 ft		
GRIS	SBCH	Az.	22°19'37"	0.007 sec	1 : 26675981	1 : 26684622
		ΔHt.	2.736 ft	0.026 ft		
		ΔElev.	8.663 ft	0.026 ft		
				0.009 ft		

		Ellip Dist.	237019.365 ft			
SBCH	15-067C-1	Az.	156°19'20"	0.011 sec	1 : 17992444	1 : 17986696
		ΔHt.	-26.644 ft	0.033 ft		
		ΔElev.	-33.630 ft	0.033 ft		
		Ellip Dist.	247721.938 ft	0.014 ft		

Date: 1/23/2018 7:51:18 AM	Project: C:\Users\ldrennan\Documents\Trimble Business Center\13002 Static.vce	Trimble Business Center
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APPENDIX 6

Fully Constrained Network Adjustment Report

Project File Data		Coordinate System	
Name:	C:\Users\ldrennan\Documents\Trimble Business Center\13002 Static.vce	Name:	US State Plane 1983
Size:	452 KB	Datum:	NAD 1983 (Conus)
Modified:	1/23/2018 7:49:08 AM (UTC:-6)	Zone:	Louisiana South 1702
Time zone:	Central Standard Time	Geoid:	GEOID12B (Conus)
Reference number:		Vertical datum:	
Description:		Calibrated site:	
Comment 1:			
Comment 2:			
Comment 3:			

Additional Coordinate System Details

Local Site Settings			
Project latitude:	?	Ground scale factor:	1
Project longitude:	?	False northing offset:	0.000 ft
Project height:	0.000 ft	False easting offset:	0.000 ft

Network Adjustment Report

Adjustment Settings

Set-Up Errors

GNSS

Error in Height of Antenna: 0.006 ft

Centering Error: 0.010 ft

Covariance Display

Horizontal:

Propagated Linear Error [E]: U.S.

Constant Term [C]: 0.000 ft

Scale on Linear Error [S]: 1.960

Three-Dimensional

Propagated Linear Error [E]: U.S.

Constant Term [C]: 0.000 ft

Scale on Linear Error [S]: 1.960

Adjustment Statistics

Number of Iterations for Successful Adjustment: 2
Network Reference Factor: 0.96
Chi Square Test (95%): Passed
Precision Confidence Level: 95%
Degrees of Freedom: 167

Post Processed Vector Statistics

Reference Factor: 0.86
Redundancy Number: 98.02
A Priori Scalar: 0.84

RTK Vector Statistics

Reference Factor: 1.09
Redundancy Number: 68.98
A Priori Scalar: 1.69

Control Point Constraints

Point ID	Type	North σ (US survey foot)	East σ (US survey foot)	Height σ (US survey foot)	Elevation σ (US survey foot)
BVHS	Local	Fixed	Fixed	Fixed	
GRIS	Local	Fixed	Fixed	Fixed	
SBCH	Local	Fixed	Fixed	Fixed	
Fixed = 0.000003(US survey foot)					

Adjusted Grid Coordinates

Point ID	Northing (US survey foot)	Northing Error (US survey foot)	Easting (US survey foot)	Easting Error (US survey foot)	Elevation (US survey foot)	Elevation Error (US survey foot)	Constr:
15-067C-1	275948.706	0.013	3909742.757	0.013	2.377	0.030	
876 0849 A TIDAL	284325.171	0.010	3912287.840	0.010	1.541	0.025	
BVHS		?		?	31.546	?	LLh

	309482.269		3894798.478				
CRMSBA SM 14	275747.352	0.009	3881961.720	0.009	1.176	0.023	
GRIS	281033.474	?	3719590.183	?	27.375	?	LLh
SBCH	501341.887	?	3806984.526	?	35.859	?	LLh

Adjusted Geodetic Coordinates

Point ID	Latitude	Longitude	Height (US survey foot)	Height Error (US survey foot)	Constraint
15-067C-1	N29°14'38.05134"	W89°21'40.71250"	-75.226	0.030	
876 0849 A TIDAL	N29°16'00.52816"	W89°21'10.35462"	-76.215	0.025	
BVHS	N29°20'12.48974"	W89°24'23.01021"	-46.745	?	LLh
CRMSBA SM 14	N29°14'40.68655"	W89°26'54.29134"	-76.461	0.023	
GRIS	N29°15'55.88300"	W89°57'26.26226"	-51.286	?	LLh
SBCH	N29°52'05.20582"	W89°40'23.63832"	-48.730	?	LLh

Adjusted ECEF Coordinates

Point ID	X (US survey foot)	X Error (US survey foot)	Y (US survey foot)	Y Error (US survey foot)	Z (US survey foot)	Z Error (US survey foot)	3D Error (US survey foot)	Constraint
15-067C-1	203691.139	0.013	-18271996.510	0.027	10162401.670	0.018	0.035	
876 0849 A TIDAL	206334.400	0.010	-18267894.241	0.022	10169669.760	0.015	0.029	
BVHS	189142.939	?	-18255649.118	?	10191879.302	?	?	LLh
		0.009		0.021		0.014	0.026	

CRMSBA SM 14	175911.228		-18272153.946		10162633.329			
GRIS	13616.876	?	-18269305.528	?	10169272.618	?	?	LLh
SBCH	103575.604	?	-18160885.910	?	10359876.751	?	?	LLh

Error Ellipse Components

Point ID	Semi-major axis (US survey foot)	Semi-minor axis (US survey foot)	Azimuth
15-067C-1	0.016	0.016	169°
876 0849 A TIDAL	0.013	0.013	170°
CRMSBA SM 14	0.011	0.011	172°

Adjusted GNSS Observations

Transformation Parameters

Deflection in Latitude:	-0.153 sec (95%)	0.028 sec
Deflection in Longitude:	0.040 sec (95%)	0.022 sec
Azimuth Rotation:	-0.014 sec (95%)	0.005 sec
Scale Factor:	1.00000016 (95%)	0.00000003

Observation ID		Observation	A-posteriori Error	Residual	Standardized Residual
BVHS-876 0849 A TIDAL (V85)	Az.	146°09'23"	0.067 sec	0.389 sec	2.195
	ΔHt.	-29.485 ft	0.024 ft	-0.126 ft	-3.522
	Ellip Dist.	30639.152 ft	0.010 ft	-0.005 ft	-0.199
BVHS --> 876 0849 A TIDAL (PV33)	Az.	146°09'23"	0.067 sec	-0.094 sec	-1.238
	ΔHt.	-29.485 ft	0.024 ft	0.021 ft	0.952
	Ellip Dist.	30639.152 ft	0.010 ft	0.035 ft	3.138
BVHS --> 876 0849 A TIDAL (PV1)	Az.	146°09'23"	0.067 sec	0.024 sec	0.304
	ΔHt.	-29.485 ft	0.024 ft	0.030 ft	1.125

	Ellip Dist.	30639.152 ft	0.010 ft	-0.035 ft	-3.046
SBCH --> 876 0849 A TIDAL (PV9)	Az.	154°56'48"	0.009 sec	0.012 sec	1.093
	ΔHt.	-27.627 ft	0.030 ft	0.006 ft	0.136
	Ellip Dist.	241225.684 ft	0.011 ft	-0.045 ft	-2.806
876 0849 A TIDAL-15-067C-1 (V86)	Az.	197°53'27"	0.324 sec	2.000 sec	2.787
	ΔHt.	0.982 ft	0.028 ft	-0.024 ft	-0.436
	Ellip Dist.	8754.491 ft	0.014 ft	-0.026 ft	-0.872
CRMSBA SM 14-15-067C-1 (V629)	Az.	90°31'40"	0.102 sec	0.094 sec	0.299
	ΔHt.	1.241 ft	0.029 ft	-0.090 ft	-1.391
	Ellip Dist.	27781.422 ft	0.013 ft	-0.088 ft	-2.545
15-067C-1-CRMSBA SM 14 (V711)	Az.	270°34'13"	0.102 sec	-0.753 sec	-2.451
	ΔHt.	-1.241 ft	0.029 ft	0.027 ft	0.391
	Ellip Dist.	27781.422 ft	0.013 ft	-0.076 ft	-1.971
BVHS --> 15-067C-1 (PV36)	Az.	156°56'37"	0.070 sec	-0.043 sec	-0.696
	ΔHt.	-28.503 ft	0.029 ft	0.021 ft	0.802
	Ellip Dist.	36712.737 ft	0.013 ft	0.026 ft	2.398
876 0849 A TIDAL-CRMSBA SM 14 (V49)	Az.	255°11'46"	0.079 sec	-0.530 sec	-2.317
	ΔHt.	-0.258 ft	0.027 ft	0.005 ft	0.077
	Ellip Dist.	31515.599 ft	0.012 ft	-0.061 ft	-1.631
BVHS --> CRMSBA SM 14 (PV14)	Az.	201°47'46"	0.049 sec	0.151 sec	2.255
	ΔHt.	-29.744 ft	0.023 ft	0.012 ft	0.462
	Ellip Dist.	36094.614 ft	0.009 ft	-0.003 ft	-0.275
15-067C-1-876 0849 A TIDAL (V166)	Az.	17°53'13"	0.324 sec	-1.368 sec	-1.793
	ΔHt.	-0.982 ft	0.028 ft	-0.012 ft	-0.254
	Ellip Dist.	8754.491 ft	0.014 ft	0.043 ft	1.350

GRIS --> 876 0849 A TIDAL (PV25)	Az.	89°42'46"	0.011 sec	0.018 sec	1.253
	ΔHt.	-24.891 ft	0.029 ft	0.004 ft	0.093
	Ellip Dist.	192724.335 ft	0.010 ft	0.026 ft	1.744
GRIS --> 876 0849 A TIDAL (PV4)	Az.	89°42'46"	0.011 sec	-0.009 sec	-0.649
	ΔHt.	-24.891 ft	0.029 ft	0.032 ft	0.712
	Ellip Dist.	192724.335 ft	0.010 ft	-0.026 ft	-1.727
BVHS --> CRMSBA SM 14 (PV2)	Az.	201°47'46"	0.049 sec	-0.118 sec	-1.708
	ΔHt.	-29.744 ft	0.023 ft	-0.011 ft	-0.347
	Ellip Dist.	36094.614 ft	0.009 ft	0.010 ft	0.789
876 0849 A TIDAL-15-067C-1 (V165)	Az.	197°53'27"	0.324 sec	1.315 sec	1.635
	ΔHt.	0.982 ft	0.028 ft	-0.022 ft	-0.368
	Ellip Dist.	8754.491 ft	0.014 ft	-0.032 ft	-0.942
15-067C-1-CRMSBA SM 14 (V784)	Az.	270°34'13"	0.102 sec	-0.309 sec	-1.171
	ΔHt.	-1.241 ft	0.029 ft	0.104 ft	1.613
	Ellip Dist.	27781.422 ft	0.013 ft	-0.066 ft	-1.615
CRMSBA SM 14-876 0849 A TIDAL (V627)	Az.	75°08'58"	0.079 sec	-0.035 sec	-0.154
	ΔHt.	0.258 ft	0.027 ft	0.007 ft	0.106
	Ellip Dist.	31515.599 ft	0.012 ft	0.061 ft	1.572
GRIS --> 15-067C-1 (PV26)	Az.	92°13'23"	0.014 sec	0.021 sec	1.554
	ΔHt.	-23.909 ft	0.033 ft	-0.006 ft	-0.129
	Ellip Dist.	190218.642 ft	0.013 ft	0.018 ft	1.211
BVHS --> CRMSBA SM 14 (PV16)	Az.	201°47'46"	0.049 sec	0.051 sec	0.767
	ΔHt.	-29.744 ft	0.023 ft	-0.038 ft	-1.552
	Ellip Dist.	36094.614 ft	0.009 ft	-0.014 ft	-1.192
876 0849 A TIDAL-CRMSBA SM 14 (V14)	Az.	255°11'46"	0.079 sec	-0.336 sec	-1.529

	ΔHt.	-0.258 ft	0.027 ft	0.010 ft	0.175
	Ellip Dist.	31515.599 ft	0.012 ft	-0.043 ft	-1.423
SBCH --> CRMSBA SM 14 (PV18)	Az.	162°26'46"	0.008 sec	0.013 sec	1.168
	ΔHt.	-27.885 ft	0.028 ft	0.020 ft	0.456
	Ellip Dist.	237737.080 ft	0.010 ft	-0.023 ft	-1.520
SBCH --> 876 0849 A TIDAL (PV28)	Az.	154°56'48"	0.009 sec	-0.017 sec	-1.503
	ΔHt.	-27.627 ft	0.030 ft	0.039 ft	0.781
	Ellip Dist.	241225.684 ft	0.011 ft	0.022 ft	1.382
15-067C-1-876 0849 A TIDAL (V710)	Az.	17°53'13"	0.324 sec	-1.123 sec	-1.481
	ΔHt.	-0.982 ft	0.028 ft	0.014 ft	0.241
	Ellip Dist.	8754.491 ft	0.014 ft	-0.046 ft	-1.120
876 0849 A TIDAL-CRMSBA SM 14 (V87)	Az.	255°11'46"	0.079 sec	0.420 sec	1.472
	ΔHt.	-0.258 ft	0.027 ft	-0.009 ft	-0.115
	Ellip Dist.	31515.599 ft	0.012 ft	0.025 ft	0.646
CRMSBA SM 14-15-067C-1 (V626)	Az.	90°31'40"	0.102 sec	-0.234 sec	-0.872
	ΔHt.	1.241 ft	0.029 ft	-0.045 ft	-0.628
	Ellip Dist.	27781.422 ft	0.013 ft	0.056 ft	1.437
BVHS --> SBCH (PV11)	Az.	336°22'08"	0.005 sec	0.001 sec	0.066
	ΔHt.	-1.858 ft	0.025 ft	0.018 ft	0.423
	Ellip Dist.	211010.773 ft	0.006 ft	0.021 ft	1.327
SBCH --> 15-067C-1 (PV30)	Az.	156°19'20"	0.011 sec	-0.005 sec	-0.439
	ΔHt.	-26.645 ft	0.033 ft	0.029 ft	0.584
	Ellip Dist.	247721.940 ft	0.013 ft	0.021 ft	1.307
CRMSBA SM 14-15-067C-1 (V505)	Az.	90°31'40"	0.102 sec	-0.307 sec	-1.263
	ΔHt.	1.241 ft	0.029 ft	-0.008 ft	-0.163
		27781.422 ft	0.013 ft	0.000 ft	-0.003

	Ellip Dist.				
BVHS --> GRIS (PV3)	Az.	261°44'17"	0.005 sec	0.017 sec	1.048
	ΔHt.	-4.594 ft	0.024 ft	0.010 ft	0.241
	Ellip Dist.	177502.914 ft	0.005 ft	0.000 ft	0.032
15-067C-1-CRMSBA SM 14 (V494)	Az.	270°34'13"	0.102 sec	-0.268 sec	-0.995
	ΔHt.	-1.241 ft	0.029 ft	-0.002 ft	-0.022
	Ellip Dist.	27781.422 ft	0.013 ft	-0.014 ft	-0.451
GRIS --> CRMSBA SM 14 (PV24)	Az.	92°33'20"	0.012 sec	-0.013 sec	-0.780
	ΔHt.	-25.150 ft	0.028 ft	0.027 ft	0.658
	Ellip Dist.	162455.946 ft	0.009 ft	-0.011 ft	-0.848
876 0849 A TIDAL-15-067C-1 (V13)	Az.	197°53'27"	0.324 sec	0.550 sec	0.844
	ΔHt.	0.982 ft	0.028 ft	0.012 ft	0.303
	Ellip Dist.	8754.491 ft	0.014 ft	-0.011 ft	-0.370
BVHS --> SBCH (PV19)	Az.	336°22'08"	0.005 sec	0.001 sec	0.072
	ΔHt.	-1.858 ft	0.025 ft	0.010 ft	0.194
	Ellip Dist.	211010.773 ft	0.006 ft	0.014 ft	0.828
SBCH --> CRMSBA SM 14 (PV12)	Az.	162°26'46"	0.008 sec	-0.009 sec	-0.765
	ΔHt.	-27.885 ft	0.028 ft	-0.034 ft	-0.649
	Ellip Dist.	237737.080 ft	0.010 ft	-0.001 ft	-0.043
15-067C-1-CRMSBA SM 14 (V502)	Az.	270°34'13"	0.102 sec	-0.014 sec	-0.050
	ΔHt.	-1.241 ft	0.029 ft	-0.051 ft	-0.743
	Ellip Dist.	27781.422 ft	0.013 ft	-0.014 ft	-0.330
CRMSBA SM 14-876 0849 A TIDAL (V504)	Az.	75°08'58"	0.079 sec	0.010 sec	0.034
	ΔHt.	0.258 ft	0.027 ft	-0.005 ft	-0.060
	Ellip Dist.	31515.599 ft	0.012 ft	0.028 ft	0.677
GRIS --> SBCH (PV7)	Az.	22°19'37"	0.005 sec		-0.291

				-0.003 sec	
	ΔHt.	2.736 ft	0.026 ft	0.023 ft	0.563
	Ellip Dist.	237019.361 ft	0.007 ft	-0.011 ft	-0.672
GRIS --> CRMSBA SM 14 (PV13)	Az.	92°33'20"	0.012 sec	-0.007 sec	-0.422
	ΔHt.	-25.150 ft	0.028 ft	-0.032 ft	-0.672
	Ellip Dist.	162455.946 ft	0.009 ft	-0.003 ft	-0.234
GRIS --> SBCH (PV27)	Az.	22°19'37"	0.005 sec	-0.003 sec	-0.260
	ΔHt.	2.736 ft	0.026 ft	-0.032 ft	-0.672
	Ellip Dist.	237019.361 ft	0.007 ft	-0.008 ft	-0.501
BVHS --> GRIS (PV5)	Az.	261°44'17"	0.005 sec	0.010 sec	0.633
	ΔHt.	-4.594 ft	0.024 ft	0.024 ft	0.548
	Ellip Dist.	177502.914 ft	0.005 ft	0.009 ft	0.594
CRMSBA SM 14-876 0849 A TIDAL (V628)	Az.	75°08'58"	0.079 sec	0.139 sec	0.630
	ΔHt.	0.258 ft	0.027 ft	-0.006 ft	-0.116
	Ellip Dist.	31515.599 ft	0.012 ft	-0.014 ft	-0.460
GRIS --> SBCH (PV29)	Az.	22°19'37"	0.005 sec	-0.007 sec	-0.601
	ΔHt.	2.736 ft	0.026 ft	-0.009 ft	-0.207
	Ellip Dist.	237019.361 ft	0.007 ft	0.000 ft	-0.024
BVHS --> SBCH (PV8)	Az.	336°22'08"	0.005 sec	-0.004 sec	-0.269
	ΔHt.	-1.858 ft	0.025 ft	0.024 ft	0.577
	Ellip Dist.	211010.773 ft	0.006 ft	0.002 ft	0.146
876 0849 A TIDAL-15-067C-1 (V50)	Az.	197°53'27"	0.324 sec	0.437 sec	0.538
	ΔHt.	0.982 ft	0.028 ft	-0.017 ft	-0.245
	Ellip Dist.	8754.491 ft	0.014 ft	-0.017 ft	-0.458
GRIS --> SBCH (PV10)	Az.	22°19'37"	0.005 sec	-0.003 sec	-0.227

	ΔHt.	2.736 ft	0.026 ft	0.020 ft	0.533
	Ellip Dist.	237019.361 ft	0.007 ft	0.008 ft	0.525
15-067C-1-876 0849 A TIDAL (V503)	Az.	17°53'13"	0.324 sec	0.140 sec	0.136
	ΔHt.	-0.982 ft	0.028 ft	-0.004 ft	-0.037
	Ellip Dist.	8754.491 ft	0.014 ft	0.023 ft	0.529
GRIS --> BVHS (PV15)	Az.	81°28'06"	0.005 sec	0.007 sec	0.441
	ΔHt.	4.594 ft	0.024 ft	-0.024 ft	-0.498
	Ellip Dist.	177502.914 ft	0.005 ft	0.002 ft	0.100
SBCH --> CRMSBA SM 14 (PV21)	Az.	162°26'46"	0.008 sec	-0.001 sec	-0.117
	ΔHt.	-27.885 ft	0.028 ft	-0.010 ft	-0.195
	Ellip Dist.	237737.080 ft	0.010 ft	-0.008 ft	-0.496
876 0849 A TIDAL-CRMSBA SM 14 (V164)	Az.	255°11'46"	0.079 sec	0.030 sec	0.099
	ΔHt.	-0.258 ft	0.027 ft	-0.022 ft	-0.225
	Ellip Dist.	31515.599 ft	0.012 ft	0.026 ft	0.486
SBCH --> GRIS (PV20)	Az.	202°28'02"	0.005 sec	-0.002 sec	-0.142
	ΔHt.	-2.736 ft	0.026 ft	-0.023 ft	-0.465
	Ellip Dist.	237019.364 ft	0.007 ft	0.000 ft	-0.027
GRIS --> BVHS (PV32)	Az.	81°28'06"	0.005 sec	0.001 sec	0.048
	ΔHt.	4.594 ft	0.024 ft	-0.020 ft	-0.456
	Ellip Dist.	177502.914 ft	0.005 ft	0.002 ft	0.108
15-067C-1-CRMSBA SM 14 (V167)	Az.	270°34'13"	0.102 sec	-0.112 sec	-0.446
	ΔHt.	-1.241 ft	0.029 ft	-0.023 ft	-0.319
	Ellip Dist.	27781.422 ft	0.013 ft	-0.013 ft	-0.407
15-067C-1-876 0849 A TIDAL (V493)	Az.	17°53'13"	0.324 sec	-0.183 sec	-0.241
	ΔHt.	-0.982 ft	0.028 ft	-0.026 ft	-0.425
	Ellip Dist.	8754.491 ft	0.014 ft	0.000 ft	-0.009

BVHS --> SBCH (PV34)	Az.	336°22'08"	0.005 sec	-0.006 sec	-0.423
	ΔHt.	-1.858 ft	0.025 ft	-0.015 ft	-0.355
	Ellip Dist.	211010.773 ft	0.006 ft	0.003 ft	0.171
BVHS --> SBCH (PV17)	Az.	336°22'08"	0.005 sec	-0.001 sec	-0.085
	ΔHt.	-1.858 ft	0.025 ft	-0.017 ft	-0.419
	Ellip Dist.	211010.773 ft	0.006 ft	-0.002 ft	-0.122
GRIS --> CRMSBA SM 14 (PV6)	Az.	92°33'20"	0.012 sec	0.006 sec	0.363
	ΔHt.	-25.150 ft	0.028 ft	0.013 ft	0.301
	Ellip Dist.	162455.946 ft	0.009 ft	0.002 ft	0.139
SBCH --> GRIS (PV22)	Az.	202°28'02"	0.005 sec	0.003 sec	0.244
	ΔHt.	-2.736 ft	0.026 ft	0.002 ft	0.038
	Ellip Dist.	237019.364 ft	0.007 ft	-0.006 ft	-0.351
GRIS --> BVHS (PV23)	Az.	81°28'06"	0.005 sec	0.001 sec	0.092
	ΔHt.	4.594 ft	0.024 ft	0.009 ft	0.224
	Ellip Dist.	177502.914 ft	0.005 ft	0.005 ft	0.335
BVHS --> SBCH (PV31)	Az.	336°22'08"	0.005 sec	-0.003 sec	-0.182
	ΔHt.	-1.858 ft	0.025 ft	-0.012 ft	-0.255
	Ellip Dist.	211010.773 ft	0.006 ft	0.000 ft	-0.015
GRIS --> BVHS (PV35)	Az.	81°28'06"	0.005 sec	0.001 sec	0.049
	ΔHt.	4.594 ft	0.024 ft	-0.008 ft	-0.192
	Ellip Dist.	177502.914 ft	0.005 ft	0.002 ft	0.150

Covariance Terms

From Point	To Point		Components	A-posteriori Error	Horiz. Precision (Ratio)	3D Precision (Ratio)
876 0849 A TIDAL	15-067C-1	Az.	197°53'27"	0.324 sec	1 : 623866	1 : 624033

		ΔHt.	0.989 ft	0.028 ft		
		ΔElev.	0.837 ft	0.028 ft		
		Ellip Dist.	8754.492 ft	0.014 ft		
876 0849 A TIDAL	BVHS	Az.	326°10'58"	0.069 sec	1 : 2978153	1 : 2977739
		ΔHt.	29.470 ft	0.025 ft		
		ΔElev.	30.006 ft	0.025 ft		
		Ellip Dist.	30639.157 ft	0.010 ft		
876 0849 A TIDAL	CRMSBA SM 14	Az.	255°11'46"	0.080 sec	1 : 2690144	1 : 2690800
		ΔHt.	-0.246 ft	0.027 ft		
		ΔElev.	-0.364 ft	0.027 ft		
		Ellip Dist.	31515.604 ft	0.012 ft		
876 0849 A TIDAL	GRIS	Az.	270°00'30"	0.011 sec	1 : 18981628	1 : 18979886
		ΔHt.	24.929 ft	0.025 ft		
		ΔElev.	25.834 ft	0.025 ft		
		Ellip Dist.	192724.366 ft	0.010 ft		
876 0849 A TIDAL	SBCH	Az.	335°06'17"	0.009 sec	1 : 23409648	1 : 23406578
		ΔHt.	27.485 ft	0.025 ft		
		ΔElev.	34.318 ft	0.025 ft		
		Ellip Dist.	241225.722 ft	0.010 ft		
BVHS	15-067C-1	Az.	156°56'37"	0.071 sec	1 : 2864703	1 : 2864479
		ΔHt.	-28.481 ft	0.030 ft		
		ΔElev.	-29.169 ft	0.030 ft		
		Ellip Dist.	36712.743 ft	0.013 ft		
BVHS	GRIS	Az.	261°44'17"	0.000 sec	1 : 0	1 : 0
		ΔHt.	-4.541 ft	0.000 ft		
		ΔElev.	-4.171 ft	0.000 ft		
		Ellip Dist.	177502.943 ft	0.000 ft		
BVHS	SBCH	Az.	336°22'08"	0.000 sec	1 : 0	1 : 0
		ΔHt.	-1.985 ft	0.000 ft		
		ΔElev.	4.312 ft	0.000 ft		
				0.000 ft		

		Ellip Dist.	211010.808 ft			
CRMSBA SM 14	15-067C-1	Az.	90°31'40"	0.102 sec	1 : 2080876	1 : 2080718
		ΔHt.	1.235 ft	0.029 ft		
		ΔElev.	1.201 ft	0.029 ft		
		Ellip Dist.	27781.426 ft	0.013 ft		
CRMSBA SM 14	BVHS	Az.	21°46'32"	0.049 sec	1 : 4040102	1 : 4043232
		ΔHt.	29.716 ft	0.023 ft		
		ΔElev.	30.370 ft	0.023 ft		
		Ellip Dist.	36094.620 ft	0.009 ft		
CRMSBA SM 14	GRIS	Az.	272°48'15"	0.011 sec	1 : 19006279	1 : 18999679
		ΔHt.	25.175 ft	0.023 ft		
		ΔElev.	26.199 ft	0.023 ft		
		Ellip Dist.	162455.973 ft	0.009 ft		
CRMSBA SM 14	SBCH	Az.	342°33'26"	0.007 sec	1 : 26316834	1 : 26308514
		ΔHt.	27.731 ft	0.023 ft		
		ΔElev.	34.682 ft	0.023 ft		
		Ellip Dist.	237737.117 ft	0.009 ft		
GRIS	15-067C-1	Az.	92°13'23"	0.014 sec	1 : 15103523	1 : 15102005
		ΔHt.	-23.940 ft	0.030 ft		
		ΔElev.	-24.998 ft	0.030 ft		
		Ellip Dist.	190218.673 ft	0.013 ft		
GRIS	SBCH	Az.	22°19'37"	0.000 sec	1 : 0	1 : 0
		ΔHt.	2.556 ft	0.000 ft		
		ΔElev.	8.484 ft	0.000 ft		
		Ellip Dist.	237019.401 ft	0.000 ft		
SBCH	15-067C-1	Az.	156°19'20"	0.010 sec	1 : 19348372	1 : 19345009
		ΔHt.	-26.496 ft	0.030 ft		
		ΔElev.	-33.481 ft	0.030 ft		
		Ellip Dist.	247721.979 ft	0.013 ft		

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